COMMONWEALTH of VIRGINIA

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MEMORANDUM

TO: State Water Control Board Members
FROM: Ellen Gilinsky, Ph.D., Director, Division of Water Quality Programs
SUBJECT: Request to Proceed to Public Hearing and Comment on Proposed Amendments to the Water Quality Standards – Triennial Review
DATE: September 22, 2009

EXECUTIVE SUMMARY

Staff intends to ask the Board for approval to go to public hearing and comment on amendments to the Water Quality Standards regulation to deal with two issues left over from the previous Triennial Review dealing with 9 VAC 25-260 Virginia Water Quality Standards. The proposed amendments would:

1) employ a conversion factor with the aquatic life water quality criteria for lead in freshwater and saltwater to apply the criteria to dissolved concentrations of lead, and
2) Replace the current freshwater water quality criteria for cadmium with entirely new criteria, updated to include new scientific information.

BACKGROUND

The Board has a legal mandate for a review of the Water Quality Standards under the Code of Virginia §62.144.15(3a) and federal regulation at 40 CFR 131 at least once every three years (i.e. a Triennial Review). During a Triennial Review the Board may adopt, modify or cancel standards as appropriate. This rulemaking is needed because new scientific information is available to update the water quality standards and changes are needed to improve permitting, monitoring and assessment programs. The goal is to provide the citizens of the Commonwealth with a technical regulation that is protective of water quality in surface waters, reflects recent scientific information, reflects agency procedures and is reasonable and practical.

During the public comment period of the last Triennial Review, six technical issues were raised that required additional study and these issues were separated out from the Triennial Review to allow time for additional review. At the October 2008 Board meeting the Board directed staff to reconvene the Triennial Review Advisory Committee to consider updates to aquatic life criteria for ammonia, copper, cadmium, cyanide and lead in § 9 VAC 25-260-140, Criteria for Surface Waters, and consider the need for a prohibition of any new or expanded mixing zones for persistent bioaccumulative toxic substances in § 9 VAC 25-260-20, General Criteria and Mixing Zones.

The original Triennial Review Advisory Committee (list of members attached) was reconvened and met five times between February and June 2009 to discuss these issues and assist DEQ in deciding what course of action to take regarding these six issues. The associated materials, presentations and summaries of the meetings may be seen online at http://www.deq.virginia.gov/wqs/rule.html#TR.

As a result of these meetings, DEQ staff is recommending two amendments to the Table of Parameters (Toxics) § 9 VAC 25-260-140 (attached). DEQ is not recommending action on the other four issues.

ITEMS FOR BOARD ACTION

1. Amend water quality criteria for lead for the protection of aquatic life in freshwater and saltwater

Criteria for metals can be expressed as total recoverable or dissolved measurements. EPA's original criteria documents are based on total recoverable concentrations of metals. However, EPA recommends using conversion factors to convert these to dissolved concentrations to better represent the potential toxic effects on aquatic life.

Virginia's criteria for lead are based on different information than EPA's criteria and staff needed to determine if the conversion factor recommended by EPA for their lead criteria is also appropriate for the Virginia lead water quality criteria. The advisory committee investigated the differences between the EPA and Virginia criteria for lead and determined the conditions in the original toxicity tests that form the basis for each of these criteria were the same. Because there was no difference in the test conditions, the conversion factor that EPA recommends applying to their criteria should be equally applicable to the Virginia criteria.

> **Recommendation**: Staff recommends adjusting the Virginia criteria for lead by applying the conversion factors recommended by EPA. This will more accurately express the Virginia lead criteria as dissolved criteria.

The conversion factor for lead acute and chronic criteria in freshwater is dependent on hardness. This will result in reducing the criterion for lead in waters with hardness greater than 25, ranging from approximately 1% to 30 % depending on the hardness level. For saltwater, the conversion factor for lead acute and chronic criteria is 0.951.

The revised lead criteria are shown in the attached § 9 VAC 25-260-140, Criteria for Surface Waters, Table of Parameters.

2. Revise water quality criteria for cadmium for the protection of aquatic life in freshwater

An assessment of the toxicity of cadmium to freshwater aquatic life was conducted by the U.S. Geological Survey (USGS) and published in December 2006. The USGS report includes consideration of all information included in the latest (2001) EPA criteria document for cadmium, plus additional, more recently published toxicity information. The USGS report represents the latest compilation of toxicity literature available for cadmium in freshwater and can be viewed as an update to the 2001 EPA criteria reassessment for cadmium. The advisory committee found this USGS report to be technically sound.

The USGS report was particularly concerned with cadmium toxicity for certain trout species resident to Idaho and the USGS report recommended establishing a lower acute criterion recommended to protect certain endangered species of trout found in Idaho. These trout species are not resident in Virginia and this extra level of protection is not needed for criteria in Virginia. Accordingly, DEQ has adjusted the acute criterion formula to apply to species found in Virginia waters.

The proposed criteria for cadmium are more stringent than the current Virginia freshwater criteria for cadmium based on a 1985 EPA criteria document. However, compared to the 2001 EPA cadmium criteria the proposed acute criterion is similar or slightly more stringent, while the chronic criterion is less stringent.

Recommendation: Staff recommends revising the water quality criteria for cadmium for freshwater based upon new scientific information. The resulting cadmium criteria will to be more stringent than the current Virginia criteria, but not as stringent as the current EPA recommended 2001 criteria for cadmium that had been originally proposed during the 2008 Triennial Review.

The revised cadmium criteria are shown in the attached § 9 VAC 25-260-140, Criteria for Surface Waters, Table of Parameters.

ITEMS INVESTIGATED BUT NOT RECOMMENDED FOR ACTION

Four other issues were discussed with the advisory committee but staff does not believe revisions to the regulation are warranted at this time:

Ammonia and Copper Criteria § 9 VAC 25-260-140
During the advisory committee meetings, new scientific information was presented that suggested the existing ammonia and copper criteria may not be sufficiently protective of freshwater mussels (including endangered species) and should be updated (made more stringent) using this new information. DEQ staff carefully reviewed all the studies and determined that there is reason to believe the ammonia criteria may need to be updated.

However, EPA is currently reviewing these issues on a national level for ammonia and some of the same issues involving the interpretation of new toxicity data for freshwater mussels also apply to copper. EPA is scheduled to release a draft reassessment of the ammonia criteria in the fall of 2009. After EPA presents their recommendations concerning these issues, Virginia will be in a better position to determine how to address them. These issues are very complex and the impact of significantly lowered criteria could be very great, particularly to municipalities.

Staff will revisit these issues after EPA publishes their reassessment of the ammonia criteria.

Cyanide Criteria § 9 VAC 25-260-140
The advisory committee investigated the potential for revising Virginia's water quality criteria for cyanide in both freshwater and saltwater based on a recent report (January 2007) produced on behalf of the Water Environment Research Foundation (WERF).

The WERF report shows the potential changes to the freshwater criteria values for cyanide are less than $\pm$ 8% different from the current criteria values and these are not considered significant enough to warrant changing the established criteria.

For saltwater, the proposed changes to the criteria are based primarily on new data from a site-specific criteria developed for Puget Sound in Washington State, and includes additional data for crabs native to the Pacific Ocean that are less sensitive to cyanide than the Atlantic crab species used in the original EPA criteria studies. Additional tests were conducted with an Atlantic species of crab, but at colder temperatures than the original EPA tests. No data are available for the blue crab species important to Virginia waters.

Differences in sensitivity between Pacific coast species and the colder temperatures used in the newer tests resulted in significant variability among the tests results, much greater variability than allowed by EPA's guidelines for developing water quality criteria. Based on the excessive differences in sensitivity and the testing at colder temperatures which may have influenced the sensitivity of the tests, DEQ staff does not recommend using these data to amend the Virginia criteria at this time.

Mixing Zones for Persistent Bioaccumlative Toxicants § 9 VAC 25-260-20

Several stakeholders recommended that point source mixing zones be restricted for persistent bioaccumlative toxicants (PBTs). Some options presented were to restrict mixing zones for PBTs for all dischargers, for new dischargers only, or for just in endangered and threatened species waters.

Much of the discussion with the advisory committee focused on polychlorinated biphenyls (PCBs), among the most widespread PBTs, and the cause of the largest number of toxic impaired waters in the Commonwealth. EPA has recently developed a low level analytical procedure for PCBs and DEQ has developed guidance for using this method in the development of Total Maximum Daily Loads [TMDLs] for PCB impaired waters. A PCB TMDL study has been completed for the tidal Potomac River and DEQ is also working on TMDLs for the Roanoke River, Bluestone River, Levisa Fork, James River and Elizabeth River. Using this new analytical method has resulted in finding PCBs in the effluents from point source dischargers. However, these are generally not considered the major sources of PCBs to the impaired waters. Diffuse sources, such as, legacy spills, abandoned industrial sites and closed landfills seem to be the largest contributors. In addition, setting permit limits for PCBs, with or without mixing zones, is not the management approach taken with point source dischargers in other states, nor what DEQ is using to implement the Potomac River TMDL. Instead, permits require the development and implantation of pollution minimization plans which appear to be a more effective approach to track down and reduce PCB levels in effluents.

Staff concluded that before pursuing mixing zone restrictions for PBTs, additional experience was needed from both the on-going TMDL studies and the use of pollution minimization plans. Also, further understanding is needed of the consequences associated with a requirement to prohibit mixing zones for PBTs. Staff will revisit the issue in a future Triennial Review process.

ATTORNEY GENERAL CERTIFICATION

These amendments have been forwarded to the Office of the Attorney General for agency statutory authority, but authority has not yet been granted. The amendments will be proposed "contingent upon Attorney General Office statutory authority" if not received by the October Board meeting.

ATTACHMENTS

Triennial Review Advisory Committee Members

State Water Control Board, 9 VAC 25-260 Virginia Water Quality Standards,
Proposed Amendments, October 2009; § 9 VAC 25-260-140, Criteria for Surface Waters, Table of Parameters.

PRESENTER CONTACT INFORMATION

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